

REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Claims 1-20 remain active in the application.

The Title of the invention has been revised in accordance with the objection thereto, which is believed to be moot.

The claims have been amended to recite a plurality of magnets arranged circumferentially on the rotor. Basis for this is evident throughout the disclosure, and particular in the figures.

Briefly, the claimed invention includes a thickness determining means in an adhesion structure for a motor, which determines the thickness of an adhesive agent of the adhesion structure for adhering the rotor (or a stator) to a plurality of magnets arranged circumferentially on the rotor or stator so as to absorb shearing stress produced by the difference between the first and second linear thermal expansion coefficients at a surface adhered to the magnets. This assures that such shearing stresses will not be so great as to lead to exfoliation of the adhesive agent layer (page 2, lines 8-15). For example, the thickness determining means can take the form of an adhesive agent groove 14 (Figure 1; paragraph bridging pages 12-13); providing an opposing surface 32a of the magnets with a radius of curvature that is smaller than that of the rotor or stator (Figures 6 and 8); or grooves formed in the magnets themselves (Figures 9-13). In each case, the disclosed structure corresponds to means for determining the thickness of the adhesive agent layer so as to absorb shearing stress produced by the difference between the linear thermal expansion coefficients of the rotor or stator and the magnets so as to absorb shearing stress produced by the difference between the first and second linear expansion coefficients.

Claims 1-3, 6-8, 14, 15 and 17-19 were rejected under 35 U.S.C. § 102 as being anticipated by Japanese patent publication 07-322576 (Suzuki). According to this rejection,

different linear expansion coefficients are inherent in the use of different materials for the shaft 2 and magnet 1 of Suzuki. However, this rejection is respectfully traversed, particularly in view of the present amendments to Claim 1.

Suzuki is directed to a permanent magnet or rotor wherein a single annular ring magnet 1 is mounted on a shaft 2 via an adhesive. Conventionally, it was difficult to avoid eccentricity between the shaft and the magnet (paragraph [0003]). Therefore, in order to provide a more uniform gap or clearance G around the periphery of the shaft (paragraph [0005]), a plurality of protrusions 23 are provided on the outer periphery of the shaft and engage the inner periphery of the magnet.

Significantly, there is no discussion in Suzuki of determining the thickness of the adhesive layer to absorb shearing stresses produced by differences between the linear thermal expansion coefficients of the shaft and a magnet. The Examiner has alleged that such differences between the linear thermal expansion coefficients are inherent in Suzuki due to the use of different materials for the shaft 2 and magnet 1. As a threshold matter, Applicants note that different materials can have identical linear expansion coefficients, and so the Examiner has not satisfied his burden of showing that such a difference must *necessarily* be present. MPEP § 2112. More significant, however, is the failure of Suzuki to teach thickness determining means which have the function of, or are equivalent to, the claimed thickness determining means.

The “thickness determining means” limitation of Claim 1 is a “means plus function” limitation having the function of determining the thickness of the adhesive agent layer so as to absorb shearing stress produced by the difference between the first and second linear thermal expansion coefficients. Anticipatory prior art must therefore provide the claimed function using structure which is the same as, or equivalent to, that disclosed in the specification for carrying out the claimed function. 35 U.S.C. § 112, ¶6. The Examiner

considers that the projections 23 of Suzuki comprise the claimed thickness determining means. However, the projections 23 do not provide the claimed function or structure.

More particularly, the projections 23 of Suzuki are described as being provided for avoiding an eccentric mounting of the magnet 1, so that the gap G is uniform about the circumferential periphery of the shaft 2. They are not described as having the function of determining the thickness of an adhesive agent layer so as to absorb shearing stress produced by the difference between first and second linear thermal expansion coefficients.

Moreover, the projections 23 will not inherently provide the function of determining the thickness of the adhesive agent layer so as to absorb shearing stress produced by the difference between the first and second linear thermal expansion coefficients, since the magnet 1 is a single annular or ring magnet. Assuming that difference in the linear thermal expansion coefficients of the shaft 2 and magnet 1 causes the magnet to expand to a greater degree than the shaft 2, the projections 23 will separate from the magnet, and will have no effect on the thickness of the adhesive layer. Conversely, if the difference in the linear thermal expansion coefficients of the shaft and magnet causes the shaft to expand to a greater degree than the magnet, the expansion of the shaft 2 will be resisted by the adhesive in the gap G being squeezed between the shaft and the surrounding magnet. The small projections 23 will be easily crushed by the magnet and will have no significant impact on the size of the thickness of the gap. Should the size difference become large enough, the adhesive will be completely squeezed out of the gap G.

Thus, the means for determining the thickness of the adhesive agent layer so as to absorb shearing stress produced by the difference between first and second linear thermal expansion coefficients in Suzuki is the single ring magnet 1 itself. However, the single ring magnet, *per se*, is not a structure equivalent to the aforementioned thickness determining

means disclosed in the present specification, and so Suzuki would not have anticipated the originally filed Claim 1.

In order to further emphasize this difference, Claim 1 now further recites a plurality of magnets arranged circumferentially on the rotor or stator. This may be contrasted with the single ring magnet of Suzuki. Moreover, the use of a plurality of magnets would not have been obvious in Suzuki since this would have been contrary to the object of Suzuki. As previously explained, the projections 23 are intended to provide a uniform gap G about the circumference of the shaft 2. However, they will do so only when acting in combination with a single annular magnet. If the magnet 1 were instead a plurality of individual magnets, adjusting the position of one of the magnets would not affect the position of the other magnets and the uniformity of the gap thickness about its circumference could not be assured. Applicants therefore respectfully submit that Claim 1 and its dependent claims are neither anticipated nor rendered obvious by Suzuki.

Claims 1-3, 6-8, 14, 15, and 17-19 were also rejected under 35 U.S.C. § 103 as being obvious over Suzuki in view of U.S. patent 5,734,216 (Yamada et al.) which was cited to teach a particular thickness for the gap. Yamada et al. is directed to a magnet rotor having a plurality of magnets, wherein an adhesive of a predetermined thickness is provided between the rotor and the magnets. However, Yamada et al. would not have rendered it obvious for those skilled in the art to have modified Suzuki to use a plurality of magnets since, as already explained, this would have destroyed the intended function in Suzuki of using the projections 23 to maintain a uniform peripheral gap. The claims thus define over any combination of the above references.

Claims 4, 5, 9, 10, 12, 13 and 20 were also rejected as being obvious over Suzuki in view of Yamada et al. (paragraph 8). In this regard, it is noted that Claims 4, 5, 9, 10, 12 and 13 depend from Claim 1 and so define over any combination of the above references for the

reasons already mentioned. Claim 20 is directed to a motor comprising a thickness determining means. Claim 20 has also been amended to recite a plurality of magnets arranged circumferentially on the rotor. Therefore, the above remarks with regard to Claim 1 also applied at Claim 20, which is unobvious over any combination of the above references.

Claim 11 is directed to the embodiment wherein the opposing surfaces of the magnets have a radius of curvature that is smaller than that of the rotor or stator. Claim 11 was rejected under 35 U.S.C. § 103 as being obvious over the above references, and further in view of JP 10-174318 (Kobayashi) which was cited to suggest modifying Suzuki to provide the claimed smaller radius of curvature. However, one skilled in the art would not have been so motivated, for a number of reasons.

First, the teaching of Kobayashi it is for a flattened portion of the magnet 4 between the magnet and the motor casing 3 (Figure 2(b)). This gap is not filled with adhesive and is not located between the rotor and a motor magnet mounted thereon. Therefore those skilled in the art would not have been motivated by Kobayashi to have provided a difference in curvature between the rotor and magnet of Suzuki.

Additionally, any such difference in radius of curvature would have been contrary to the teachings of Suzuki. As has already been explained, the object in Suzuki is to maintain a *uniform* gap thickness about the entire circumference between the shaft 2 and the ring magnet 1. This requires that the inner curvature of the magnet and the outer curvature of the shaft be matched. One skilled in the art would not have found it obvious to have provided a different curvature for the magnet and shaft in Suzuki since this would have been contrary to the goal of a uniform gap thickness. Accordingly, Claim 11 defines over any combination of the above references.

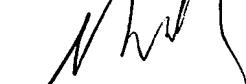
Concerning paragraph 10 of the Office Action wherein Claim 16 was rejected under 35 U.S.C. § 103 as being obvious over Suzuki in view of Yamada et al. and U.S. patent

4,155,021 (Corbach et al.), it is noted that the projection surface 6 of Corbach et al. is located at the yoke 2, and does not determine the thickness between the magnet 3 and the rotor 4. Accordingly, Corbach et al. could provide no teaching for overcoming the shortcomings of the aforementioned prior art with respect to Claim 1. All of the claims therefore define over the cited prior art.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Robert T. Pous
Attorney of Record
Registration No. 29,099

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)
RTP:smi

I:\ATTY\RTP\246072US-AM.DOC